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# The Trade Review.

A JOURNAL OF MANUFACTURES, COMMERCE, INDUSTRY, SCIENCE, ART AND INVENTION.

Vol. XIV.—No. 49. CLEVELAND, DECEMBER 3 1881. No. 722


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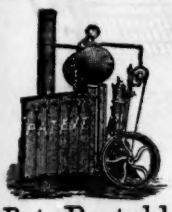

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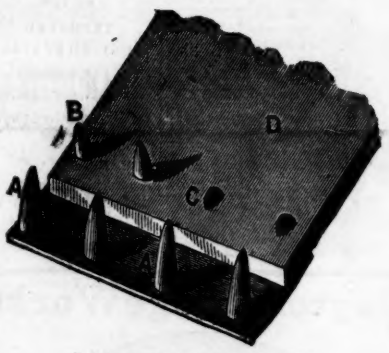


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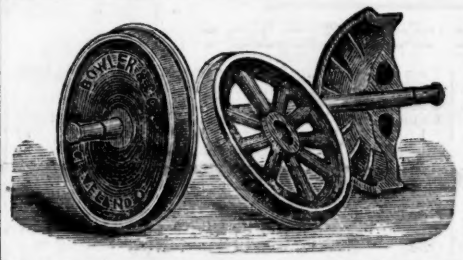


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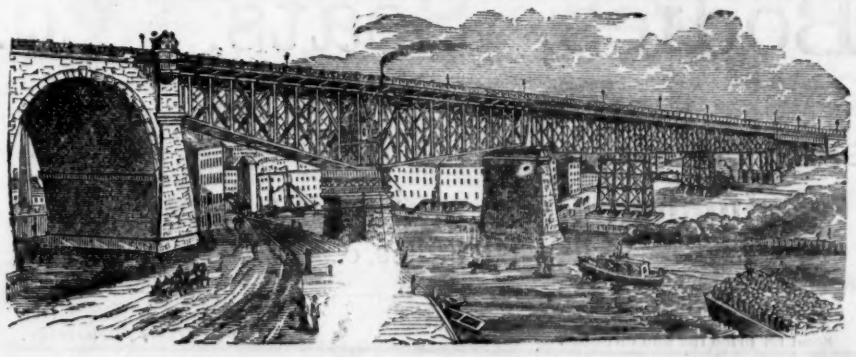

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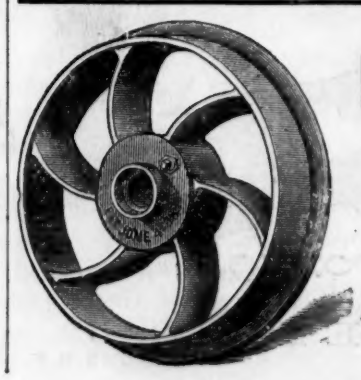

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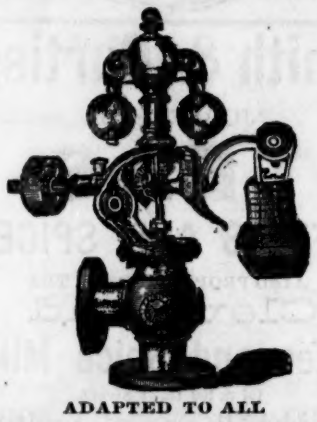

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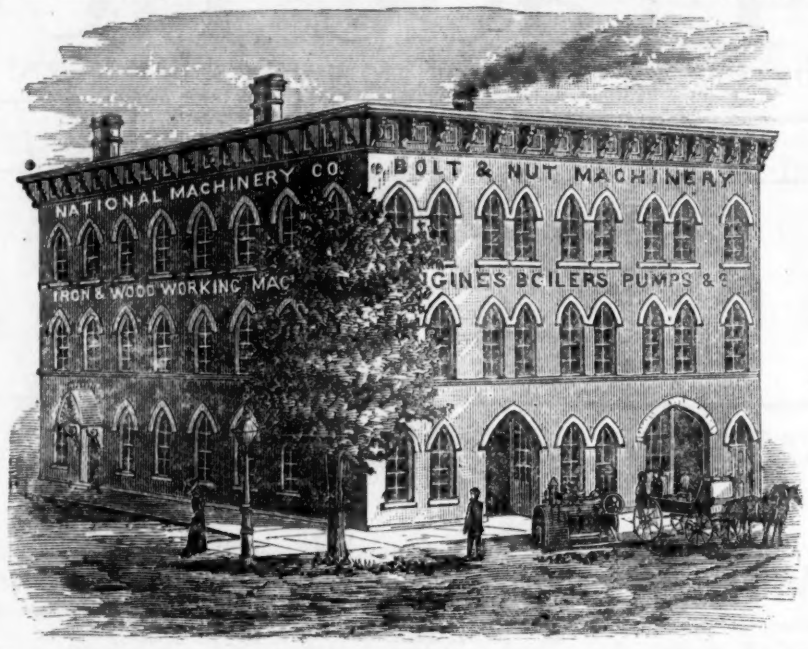


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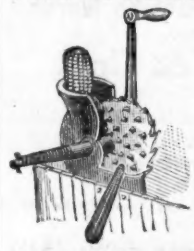

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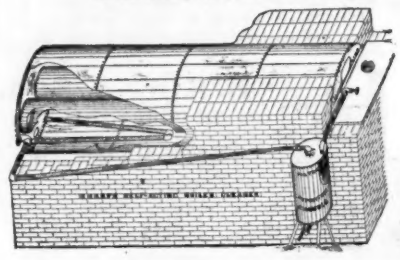

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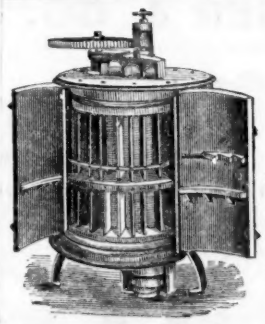

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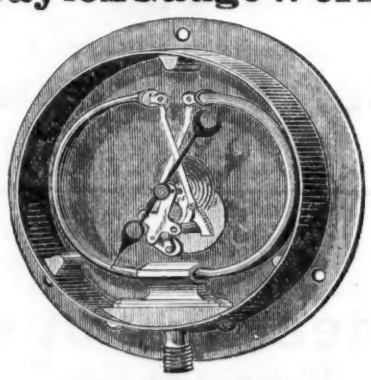

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FOURTEENTH YEAR.

**The only strictly Manufacturing, Industrial and Scientific Paper published in Ohio.**

THIS JOURNAL IS APPOINTED THE
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OF THE
OHIO INSTITUTE OF MINING ENGINEERS.

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## CLEVELAND'S COAL SUPPLIES.

In a former issue we called attention to the vast coal deposits of Coshocton county, suitable for domestic and manufacturing purposes, 70 miles east of Columbus and 75 miles south of Lake Erie, being 100 miles nearer than the Straitsville deposits, and with which this city will be placed in connection by the completion of the Connotton Valley & Straitsville Railway line. In referring again to these valuable coal deposits we present the following analyses by Professor Wormley, which, as will be seen, is very favorable to the Coshocton coal.

ANALYSES BY PROF. WORMLEY.

| | Massillon. | Coshocton. | Hocking Valley. |
|---|---|---|---|
| Specific Gravity | 1.247 | 1.296 | 1.287 |
| Water | .695 | .360 | .580 |
| Vol. Combustible | 32.38 | 36.10 | 35.42 |
| Fixed Carbon | 57.49 | 58.00 | 51.15 |
| Ash | 3.18 | 2.20 | 7.63 |

At the trial of leading coals at the Chicago Water Works a ton of No. 9 anthracite was taken as the standard on Mr. Creggins' test. It was found thut this ton was equal to 1.277 tons Indiana bituminous coal; or to 1.221 tons of Indiana block coal; or to 1.119 tons Straitsville, Ohio, coal; or to 1.109 tons Coshocton, Ohio, coal. The gallons of water pumped per pound of coal are respectively: Lackawana, anthracite, 375.6; Indiana, bituminous coal, 334.8; Indiana block coal, 320.0; Straitsville coal, 343.2; Coshocton coal, 368.3. This is an extremely creditable showing for the Coshocton coal. It is quite probable that with improved methods of burning our bituminous coals, the slight difference (only 7.3 gallons) between its evaporative power and of the Lackawana (anthracite) will be more than overcome. Until recently, the supposed superiority in heating value of the more concentrated fuels led to the practice of coking or de-bituminizing the coals, and quite lately the practice was followed upon all English railways, for the sake of the greater calcalorific power. In the West bituminous coals are chiefly used for the generation of steam, but there is great difference between them in their relative evaporative powers. Since the experiments with the Coshocton coal at the Water Works at Chicago other trials have been made of this at other places, especially as a locomotive fuel, the results proving favorable. One of these trials was on the P. C. & St. L. railway, made under the direction of Mr. John Durand, the General Superintendent at that time. The results of his tests proved highly satisfactoty. In evaporating power 27 bushels of Coshocton coal were found to equal 34 bushels of the Hocking Valley coal. Subsequent trials, for similar economic purposes, seem to have fully verified the results obtained by Mr. Durand.

A steam coal of high order is a rare thing even in our western coal fields. There are so many considerations which determine the value of a coal such as its working under the boiler, quality of flame, rapid and perfect combustion of the gases, coke, ash, freedom from clinkers, sulphur, &c., &c., that an accessible coal field affording a superior locomotive fuel has a value hardly to be overesti mated. A coal having all these good qualities must also be a good house coal, making in the grate a cheerful and hot fire. For the rolling mills the Coshocton coal is also well adapted. There is reason to anticipate that field will furnish a coal which will in a high degree meet all these demands.

## PROGRESS OF MECHANICAL ENGINEERING.

The address delivered before the American Society of Mechanical Engineers at New York, by Robert H. Thurston, its President, is to be regarded as a valuable summary of engineering progress made. We propose to enumerate briefly some of its leading points. Referring to iron as slowly and steadily displacing steel, Mr. Thurston observ ed that cast iron in small parts is less and less used as steel castings become more and more reliable, and especially as the art of making drop forgings of larger size and in more intricate forms is perfected. Sheet steel, very low in carbon and other hardening elements, is being adopted in boiler making, not because of its greater strength, for the stronger grades are always rejected by the experienced boiler maker, but because of the greater uniformity, ease of working, freedom from cinder, and the durability of those grades which are well suited to such use. In fact, we are apparently coming to a manganese steel as the metal for use in general construction. Tenacities of from 75,000 to over 100,000 pounds per square inch have already been attained. Dr. Fleitman's discovery of a method of making nickel malleable and capable of welding, and his similar improvement of commercial cobalt by the use of magnesium was recognized as not only in itself important, but as likely to lead to further progress. As to the effect of variation of temperature in the annealing of iron and steel metals, and in the hardening and tempering of steel, which has long been known, it was noted that there exists a critical temperature probably definite and fixed for each grade. This critical temperature has now been identified, but we may doubt the correctness of Mr. Thurston's surmise that it may probably prove the same for all grades. Preliminary straining to secure an elevated initial elastic limit with relief of internal stress as likely to be of service in the applications of iron and steel, as by cold-rolling, by "frigo-tension" and "thermo-tension," and by wire-drawing, was next adverted to. With the progress made in the testing of steel and iron material we may anticipate with Mr. Thurston that each bridge over which we ride, each machine upon the strength on which depends safety of life and property, that its every part has been proven, will come to be so tested as to be perfectly safe. The advance of mechanism and art in the manufacture of textile goods, affording better and more varied products, and these in greater quantity and at cheaper rates, was treated of so far as relates to mechanical engineering. Speeds of cotton spindles have risen during the two last decades from 5000 to 7500 revolution per minute. Looms then making 120 picks per minutes make now as high as 160, and one hand takes charge of from 25 to 50 per cent more work. The "Slasher" dresser does ten times the work of the old machine, supplying 400 looms in place of 40, and demanding the attendance of only one man and a boy, instead of two men and ten girls. Pickers handle a ton of cotton per day in place of a half or five-eighths of a ton. The humanitarian effect of improvement in this line is not to be overlooked. With immensely greater production of textiles the time of artisans has been curtailed. "When the last generation was in its prime our factories were in operation twelve or thirteen hours; 'a man's work was sun to sun, and woman's work was never done.' To day man works ten hours,and woman is coming to a stage in which she will work where, when and how she pleases. Then three yards an hour was the product for a single operative; to day ten yards per worker are produced. In twenty years the annual product in cotton mills has risen from 2½ tons to 3½ tons per annum per mill hand; wages have increased 20 per cent., and the buying power of the dollar has risen in much more than equal proportion, thus adding 50 per cent. to the comforts and luxuries of working people." Where one hand then drove 40 spindles he now manages 60, and every seven of the more than 10,000,000 of spindles in operation works up a bale of cotton each year and turns out $100 worth of product. Thus is the world's wealth added to, whilst there is a clear gain to consumers in the cheapening of goods. The changes in the system of steam transportation was glanced at from an engineering point of view, and railway extension was commented on as affording the strongest safeguard against political dissensions and disunion. "To-day," said the speaker, "we have 100,000 miles of track laid down in the United States—we have about one-half of the constructed railroads of the world. Trains here and in Great Britain make 50 miles an hour on schedule time, taking water from the track, and receiving and delivering mails without stop. A speed of 100 miles—Stevens' maximum figure—has been many times attained." The efficiency of the late styles of stationary engines, the competition of air gas and oil engines,all illustrate the animating spirit of modern mechanics. What engineers need more fully to direct attention to was pointed out to be improvements designed to reduce waste, including automatic devices lowering the cost of attendance. The statement of Mr. Thurston on that feature of recent progress of engineering,—the introduction of machine-made electricity for motor purposes with his conclusion is worthy of attention. It is that the mean of several tests of efficiency of a powerful dynamo-electric machine loaned him at Menlo Park showed a loss of transmission of only 20 per cent. The full verification of this small proportion of loss will afford the prospect of a brilliant future for electro motors.

## THE COTTON TRADE OF THE WORLD.

The State Department has issued an important document entitled "Cotton Goods Trade of the World," and consisting of reports from our Consuls in all cotton growing, manufacturing and consuming countries, with a survey of the industry and trade in the United States. The cotton product of the several countries is estimated at about 3,506,000,000 pounds, viz: Product of the United States, 2,770,000,000 pounds; product of the East Indies, 407,000,000 pounds; product of Egypt, Smyra, &c., 269,000,000 pounds; product of Brazil, 44,000,000 pounds; product of the West Indies, &c., 16,000,000 pounds. These figures show that the United States produces nearly four-fifths of the cotton crop of the world. While, therefore,

it might not be safe to assert that the cotton-manufacturing nations are wholly dependent upon this country for their supplies of the raw material, it may be safely assumed that under a continuation of favorable circumstances, such as we may reasonably expect to prevail, it is beyond the productive power of any other country to compete with the United States in raw cotton, and that, at best, other countries can only hope to fill up what may be called the interstices of the trade, by supplying inferior and cheaper fiber to be mixed with American cotton, or to be used in the manufacture of inferior fabrics. Our civil war occasioned extraordinary efforts on the part of British capitalists to encourage the growth of cotton elsewhere, in fact, to render England independent of the United States, but, as here observed, "when peace opened our Southern ports to commerce, and when the Southern planters, with free labor, demonstrated that the cotton producing capacity of the United States had never before been fully appreciated, the growers of India and the manufacturers of England became convinced that competition with the United States was impossible." The statistics show that in 1880 our imports of cotton goods amounted in value to $29,929,000, and our exports to $9,981,000, thus showing that our imports of cotton manufactures are three times greater than our exports. All this excess, however, consists of fancy goods, the domestic manufacture of which has not yet reached that perfection toward which it is tending; and we may may expect that for some years to come we will have to draw upon Europe for more or less of this class of goods to supply that demand which the home manufacturess will be unable to meet. In piece goods, however, we have reached that stage where, after supplying home demands, we have a surplus left which must find consumption in foreign markets; and as this over production will continue to augment year after year, a full understanding of the world's wants is of the first importance to our manufacturers. The value of British piece goods exported during the year 1880 was as follows: Piece goods, plain, $168,000,000; printed piece goods, $108,348,000; mixed piece goods, cotton predominating, $2,654,-000. We append an estimate, exclusive of the product of primitive hand-looms, (which latter engage the industry of millions in Asia) of the value of the yearly cotton manufacture of the world: United Kingdom, $561,170,000; France, $97,200,000; Germany, 106,920,000; Russia, $102,-060,000; Belgium and Holland, $63,180,000; Austria-Hungary, $63,180,000; Italy, $24,300,000; Spain, Switzerland, &c., 63,000,000; United States, $233,280,000; India, $34,020,000; making a total of $1,348,310,000. It is pointed out that there is a large field for the development of machine-made goods in Asia, the Chinese alone manufacturing 7,300,000,000 yards annually. If, as our consuls assert, the consumers in all countries prefer pure goods to the adulterated, and if it only requires time and hard labor to convince them that the best is the cheapest—as some sections of Africa have become convinced—the general outlook for our manufacturers is promising. We have only to continue the manufacture of pure cottons; use all the trade appliances of supply and distribution which have been put in operation by British manufacturers; study the tastes and habits of the various countries; survey all markets before entering commercially thereon; sacrifice profits for a time, if necessary, to secure trade-standing in the several markets; treat the consumers honorably; let all goods be as represented; and the several roads to universal trade are more open to us to day than they were to the British manufacturers thirty years ago. The cotton goods trade of the world is a vast subject and requires the best consideration of American manufacturers—united consideration to be followed by united action—but if the same masterly direction of forces be applied toward its diversion to the United States as have been applied by the statesmen and manufacturers of Great Britain to the development of their trade, the world offers a field large enough for the consumption of all the manufactures we can produce, even were our entire product of the raw material converted into American cloth, instead of being exported, in such large quantities as it is at present.

### THE MEETING OF OHIO EDITORS AT YOUNGSTOWN.

Youngstown has received and handsomely entertained this week the Ohio Editorial Association. The unstinted liberality displayed redounds to the honor of that enterprising city. The opportunity was afforded of inspecting her rolling mills, blast furnaces, flouring mills, bridge works, bolt and nut works, and other industries that are adding to her wealth and greatness. The view of the vast machinery in play, the exhibit of skilled workmanship, excited admiration for the energy and enerprise which has been brought to bear on her mechanical development, and called up visions of a far more magnificent future. The banquet at the Tod House, given by the leading citizens of Youngstown to the men of the pen, whose business it is to represent all the influences at work, material, financial, commercial, moral, literary, and political, was an occasion for the exercise of those amenities which strengthen friendliness of feeling and raise the dignity of the editorial profession. The citizens of Youngstown have done well, and their hearty reception will be gratefully remembered. Praise must be accorded to the liberality of the New York, Pennsylvania and Ohio, and New York, Lake Erie and Western Railroad Companies, in affording the members of the Associa tion an opportunity of visiting the Empire city, where they were the guests of those Companies at the Grand Central. As an exhibit of the manufacturing capacity of Youngstown we publish the following carefully compiled statement, by C. H. Andrews, of the railroad tonnage of Youngstown for last year. Net rolling mill tonnage for 1880: Iron, nails, etc., produced, 126,150; mill cinder produced, 30,160; pig iron used, 143,060; coal used, 389,170: iron ore for fixed use, 35,280; fire brick used, 2,920; total tons transportatiou, 726,-750. Net blast furnaces tonnage for 1880: Pig iron produced, 236,030; iron ore used in production, 441,890; limestone used in production, 178,-340; coal consumed in production, 278,620; coke consumed, 192,030; fire brick used, 3,410; total transportation in tons, 1,330,320. Total tonnage in Youngstown and vicinity for 1880: Rolling mills, 726,750; blast furnaces, 1,330,320; coal mines, 1,000,000; foundries and machine shops, 15,000; agricultural works, 5,000; lumber, 10,000; retail coal, etc., 30,000; flouring mills, 3,000; bridge works, 3,000; bolt and nut works, 15,000; grand total of net tons, 3,138,070; grand total of pounds, 6,276,140,000. These figures do not include the tonnage of general merchandise of that enterprising city. The tonnage capacity of works not in operation in 1880 was 83,000. The present year has witnessed a new and vigorous impulse imparted to the manufactures of Youngstown. The city, among her recent acquisitions, has a large car manufacturing company, one of the finest mower and reaper works in the world, malleable iron works, scale works, and, we understand, large scale works have recently been organized. This array of industries scarcely needs any comment. We might proceed with an enumeration of new industries that have sprung up within that city, the germ of yet greater things. In addition, numerous manufactories have been and are still being extended, such as the large carriage works. With further increased capacity the production of the present year is certain to show a splendid advance on Youngstown's previous accomplishments.

THE effect of the stringency of the money market has been to lessen the price of exportable products. The falling off in grain exports is solely attributable to the "corner" in grain. The prices to which grain was carried has reduced the European demand, supplies on a larger scale than would otherwise have been the case having been obtained by Great Britain from other quarters. Russia has particularly benefitted, and shipments at Odessa, the great southern grain entrepot of that country, have been going on night and day. It was the stringency in the money market, and nothing else, that caused the operators to unload, but events have shown that they would have been still greater losers had they pursued an opposite course. Grain and other products are still at a figure not warranted by the foreign demand for our supplies. Capital has been sunk in carrying over this surplus; and not only this but the requirements of the operators have seriously curtailed the facilities for carrying out industrial enterprises.

IT is possible, remarks the Boston *Commercial Bulletin*, that the present fierce competition of our trunk line railways for the control of the trade between the east and west has been chiefly forced by the formidable danger of the lake ports becoming leading emporiums of foreign commerce by the way of the St. Lawrence, the Erie canal and the Hudson River, and that a similar danger is threatened by St. Louis and New Orleans for the trade between the West and Europe by the Mississippi route.

THE manufacturerers of Cleveland held a meeting on Monday to select additional delegates to the Tariff Convention at New York. The gentlemen selected are strong protectionists, and represent important industrial departments.

## MANUFACTURES.

### TO MACHINISTS, MANUFACTURERS AND OTHERS.

THE publishers of THE TRADE REVIEW solicit items of information concerning manufacturing and other establishments in any part of the country, and all such items will be promptly inserted in these columns, free of charge. Facts are the only things needed; and all communications should be accompanied with the name of the contributor—not for publication—but as a guarantee of good faith.

Manufacturers, machinist and engineers are particularly requested to communicate any matters of interest relating to their specialties. No one need be deterred from sending any interesting facts in his own language, as all such contributions will be properly revised befor sendin to press.

### OHIO INDUSTRIES.

THE ground is being laid off at New Philadelphia for the erection of the Ward Iron Works.

MR. WM. SMITH, of Pittsburgh, is about to commence the erection at New Philadelphia of his pipe gas factory works.

THE Bellaire Sheet Iron Company has been organized at Bellaire, with a capital of $200,000. A site will be immediately selected and a rolling mill built.

THE Duryea blow-pipe furnaces, for the production of wrought iron directly from the ore by the use of petroleum fuel, is making a success at the experimental works in Toledo. It is said that an average of 40 gallons of petroleum makes one ton of wrought iron.

THE Calumet Mills, at Ironton, having placed 87 nail machines in the nail department of their works, have ordered, from the manufacturers at Pittsburgh 25 more, making in all 112 machines. This will give the works a capacity of about 1100 kegs a day, and will furnish employment to 175 to 200 hands. The number now employed is 150. —*Chicago Indus. World.*

THE Pine Grove Furnace is doing well, averag ing about 18 tons daily.

THE Globe Iron Company, Cleveland, are running their works night and day with a force of 175 hands.

SMITH, VALE & Co., Dayton, are employing 150 hands, and find all their facilities inadequate to meet the demand of the trade.

BELLAIRE Furnace will be ready to start up in three weeks. It awaits the completion of the stack, which will be 66 feet high.

THE Cleveland Hardware Company, which occupies the former buildings of the Brush Electric Light Company, are doing a splendid business.

THE Boyer Elevator Company, Cleveland, have their hands full in the manufacture of hydraulic elevators. They find good customers in Buffalo.

THE new spiegel furnace at Brier Hill is at present running on foundry iron, turning out about 20 tons per day. In a short time it will be put on spiegel.

THE Akron Stoneware Company are producing ware to the extent of 24,000 gallons per week. They are constantly shipping large quantities of goods to all quarters.

THE Mahoning Valley Iron Company have leased the entire Hubbard Rolling Mill for a year,with the privilege of purchasing it at the end of that time. The establishment will be started in full blast next Monday.

SUMMER BROS. & Co., Youngstown, are pushing their enterprise of establishing a rolling mill at Niles with commendable energy. As they are all practical iron workers the enterprise cannot help but be a good investment for the projectors, and a worthy addition to Niles.—*Youngstown News.*

PLANS and specifications are being drawn for some improvements on the furnace of the New York and Ohio Iron and Steel Company,which will likely be put in full blast sometime this winter. They will not mine any ores on their lands until spring, but use lake ores and cinders.—*Chicago Indus. World.*

THE works of the Lima Car Company, lately incorporated with a capital of $250,000 for the manufacture of freight cars, will occupy 14 acres of ground and will consist of six large buildings. The president of the company is Mr. C. S. Brice, who is also vice-president of the New York, Chicago and St. Louis Railway Company.

ONE of the most successful manufactories of agricultural machines is that of Messrs. Hooven, Owens, Rentschler & Co., Hamilton. The Illinois *Tradesman and Manufacturer*, Peoria, says of it: This company's works cover some four acres of ground and employ upwards of one thousand skillful mechanics, draughtsmen and workmen in order to supply the wants of the nation's trade, for it must be remembered that this great establishment's business extends to all States and Territories west of the Empire State, and as a consequence it is one of the great business industries of the country.

THE Crawford property at Bridgeport, Belmont County, has been lately purchased by a syndicate consisting of Ross J. Alexander, James J Holloway, Wilbur, Charles and A. P. Tallman and T. Graham, and it is authoritatively stated that these gentlemen are about to commence the erection of a pottery at a very early date. The price paid for the ground was $25,500. It contains 74 acres and has a river frontage of 450 feet. The C. & P. railroad passes through the tract. Only part of it will be used for the pottery, it being the intention of the owners to sell part of the land for a flouring mill. The whole property overlies a fine vein of coal, which is available for manufacturing purposes at a small outlay, and the proprietors would be willing to sell a site for a glass factory, for which the facilities are said to be admirable. As soon as they procure the services of a suitable superintendent they propose to commence the construction of one biscuit and two glass kilns on the line of the railroad, and to the east of these will be located the works proper. We are informed that it is the intention of the above named gentleman to make one of the finest and most complete potteries in the country.—*Amer. Pottery and Glassware Reporter.*

THE Bridgeport Brass Company is driven with orders. It has added to the works a brick building 144x45, three stories; is putting in a new Wheelock engine, 300-horse power, and is employing about 250 hands.

THE Columbus and Hocking Valley Railroad Company have purchased six acres of ground at Logan for the erection of extensive car and repair shops, which will give employment to no less than one hundred more men.

STRUTHERS Furnace at Youngstown, O., owned by the Struthers Iron Company, will be put in blast. Since it was blown out over $4,000 have been expended in making repairs and improvements that will add to its capacity for production and the quality of iron.

THE Burgess Iron and Steel Company, Portsmouth, are using a blackband ore recently discovered in the vicinity of Portsmouth, that is said to contain about 50 per cent of iron and to have veins of coal through it sufficient to roast it.—*Amer. Manufacturer.*

THE Bridgeport Brass Company are driven with orders, and had they double their capacity they could use it to good advantage. They have added to their works a brick building, 154x45, three stories, and are putting in a new Wheelock engine, 300 horse power, and are employing about 250 hands.

IRON ship-building on the Northern lakes is now fully established as a permanent industry. Cleveland is the foremost port in this line. This year her builders have launched six steamships, ranging from 240 to 290 feet of keel, and four more of equal size are under way, including a large iron steamer, building by the Globe Dry Dock Company.

AKRON Iron Company, at Buchtel, are making 45 to 50 tons of pig iron per day, but are much in need of cars to ship their iron. The company, are erecting a new store house, which will be the finest in the Hocking Valley. It is 60x150 feet, two stories high, brick and iron, contains three main rooms besides offices and storage rooms.—*Amer. Manufacturer.*

THE Elyria Shear Company have plans drawn up for extensive works which they will build in the spring. The company were established in 1878, and their business has increased every year. At present they employ 70 hands, and will double their capacity in the spring. They are the sole manufacturers of Hatch & Clauses' patent solid steel blade shears and scissors, in which they have a large trade.

THE Britton Iron and Steel Company, Cleveland, has been making several improvements at the works, which increases its capacity very materially. It has put in one new heating furnace and four knobbling fires and is about adding four more puddling furnaces, which will in all give a capacity of twenty-five tons boiler plate and seven tons galvanized sheet iron per day. The company commenced using the Brush electric light last week, with six lamps, which it finds a great improvement over the oil lamps, which it has been using on the night turn.

THE Akron *Beacon* in reviewing the industries of Akron for 1881 says: Our shops, without exception, have been running to their fullest capacity, and although nearly every large shop in our city has almost doubled up in capacity, there is not an idle corner in a single establishment within our corporation. Never in the history of Akron has more business been done than has been transacted in 1881, and there is scarcely a city in the United States that has not some of our products, while the foreign markets make large demands for the products of Akron manufactories. Taken all in all, the industrial pursuits, of whatever character in the city, during the present year, have made it a scene of the most busy activity. Capitalists have had a good return from their money invested, and though many transactions were close, yet business generally was safe and but few losses occurred. As a community we have been blessed, and there is reason for rejoicing among all classes of men for the fruitful season we have enjoyed. The Winter, which is before us, is full of promise in the way of labor and a ready sale for all kinds and grades of goods that our mills, shops, merchants and tradesmen of all kinds are concerned in

THE Ohio Grindstone Company, Cleveland, have their productions sold for many months ahead.

PRINCIPAL among the new structures now under headway at Akron is an extensive addition to the Weary, Snyder & Wilcox Manufacturing Company's Planing Mill on North Main Street. The new part will be directly north of the present factory, and will be 42x54 feet in dimensions, and three stories high. The lower story will be of stone and the upper stories will be frame, with fire-proof roof. Several new machines will be placed in the new part, largely increasing the capacity of this establishment. The new addition was rendered necessary by a steadily increasing business which required the erection of additional room in order that the large amount of work on hand and sure to come during the Winter could be turned out with the despatch and promptness which characterizes this and many other Akron institutions.—*Akron Beacon.*

### INDUSTRIES IN GENERAL.

THE Allen Paper Car Wheel Company, Ill., will turn out 25,000 wheels the coming year.

A PROJECT is on foot to start a sewing machine manufactory at La Crosse, Wis., with a capital of $200,000.

LEADVILLE, Colorado, has thirty-six furnaces, with a daily capacity of 1,000 tons; and ninety-five stamps of 280 tons daily capacity.

THE New England Specialty Company, North Easton, Mass., have an order for 100,000 spindles from the Domestic Sewing Machine Company.

THE Esty Organ Company, Brattleboro, Vt., have built a new engine-room, and have recently sent several hundred organs to England and Germany.

THE Enterprise Manufacturing Company, Sandwich, Ill., have increased their capacity, and will manufactnre from 8,000 to 10,000 cultivators this coming season.

THE Columbian Marble Company, Rutland, Vt., are putting up three new buildings which gives 8,000 feet of flooring additional and will increase their capacity fifty per cent.

GAY, KIMBALL & GAY, Rutland, Vt., manufacturers of vegetable ivory and composition for buttons, are adding machinery which will increase their capacity to 400 gross a day.

AT the nail factory of the E. & G. Brooke Iron Company, at Birdsboro, there was manufactured per month upwards of 20,000 kegs of "Anchor" brand cut nails.

THE Muskegon Car and Engine Works, Mich., organized six months ago, expect to complete $100,000 worth of work this season. They have a contract for 900 cars for Western railroads.

THOMAS WISE, South Farmington, occupies the shop connected with the old print works at Ashland, for the manufacture of his blower motor, a device by which a blower can be run without the use of a belt or engine, by making use of a jet of steam.—*Boston Journal of Commerce.*

A company has been formed in Philadelphia, with Colonel C. S. Ryder as president, for the manufacture of cork horse shoes. It is claimed that the cork is treated by what is known as the Mackenzie process, and that it outlasts iron for the same purpose.

THE Chicago & Alton recently built a number of United States Car Company's screw lever dump cars at its Bloomington shops, and at a trial of one of them the other day it was unloaded in 32 seconds. It carried twenty tons and was loaded with ore cinders.

ONE of the busiest places in Chester, Pa., is Roach's ship yard. The work now under way includes two steamships, each 287 feet long, for the Old Dominion Steamship Company, of New York, to run on their line between New York, Norfolk and Richmond.—*Iron Age.*

THE Richmond Stove Works, Norwich, Ct., find their production of stoves and ranges to have increased this year from the value of $150,000 to $200,000. They send their productions to all parts of the country. They employ 65 moulders "at the bench" beside doing a large amount of floor work. They have made about 13,000 iron sinks during the last year.—*Boston Jounnal of Commerce.*

THE Matthews cotton factory of Dallas county, Ala., employs about 300 boys and girls, and could give employment to 100 more. The stock is said to be worth 45 per cent. premium, and none can be found on the market at that.

THE Wilson Manufacturing Company, New London, Ct., are running from 60 to 65 men full time. They have begun the manufacture of jack screws, and have just issued a new discount and advance sheet.--*Boston Journal of Commerce.*

SEWALL'S FALLS, Concord, N. H., has been purchased by a party of Concord capitalists, and will be developed for manufacturing purposes.—*Ibid.*

THE Colt's Company, New Haven, Conn., have a large business in their double-barrel gun, on account of its exactness and the lower price as compared with foreign made guns. Orders from the West are increasing.—*Ibid.*

BROCTON, Mass., now manufactures more sewing machine needles than all Europe combined. They are turned out by the million and shipped all over the world. The needle, made of the best steel, passes through thirty different hands in its manufacture before leaving the factory.

THE Star Brewing Company, Cliff street, near Lake avenue, Rochester, N. Y., employs 69 hands. It has been in existence since 1875. The capital stock is $1,000,000 is invested in the business. The company ships all over the Union. It will brew 65,000 barrels of lager this year.

THE Whip Manufacturers' Combination for uniform prices will probably, after all, not be broken up December 1, as the outside firm, which was likely to prove a strong competitor, has consented to join, and the association thinks itself strong enough now to suppress concerns who gain custon by ruinously cutting prices.—*Boston Manufacturers' Gazette.*

THERE is a fair prospect that within twenty, if not ten years, the United States will stand at the head of the nations in cotton manufactures. In the past ten years while Great Britain has made a slight gain in the amount of her manufacture, the gain of the United States has been more than 100 per cent. The quantity of cotton manufactured in the United States in 1880 was, in round numbers, 950,000,000 pounds; in Great Britain, 1,400,000,000 pounds. The gain of the United States has been so rapid that if the same proportion shall be kept up, her consumption of the product will exceed that of Great Britain in much less than ten years.

### Leather Belting.

Mr. Robert Grimshaw, mechanical expert, Philadelphia, having written to the *Mechanical Engineer*, that he is engaged on experiments on leather belting the data from which upset all previous experiments, that journal remarks: The bottom facts are that what may be styled laboratory experiments do not always coincide with shop results, and it is in the attempt to make them that confusion ensues. For example: a machinist said to us recently that he supposed nothing was better settled or more generally accepted as correct, than the view that the hair side of a belt was the proper one to drive with, and his practice had always been to run the hair side next the pulley, but his faith in this, as an axiom in belting, so to speak, received a severe shock one day, when new machinery was put on in his shop and the driving belt would not carry it. More from curiosity than any expectation of benefit, he turned the belt over, and found that it drove the additional load without difficulty. His present condition of mind is doubt and uncertainty regarding belt-action under all circumstances. This is the position of many, who, despite the insistance of some who assert that the smoother the surface of the pulley the more driving power is obtained, continue to roughen the surface of pulleys by artificial coverings of one kind or another, to their own advantage and the confusion of theories. Where all these experiments are to land us is a question more easily asked than answered.

THE amount of cotton goods manufactured in the United States this year is larger than ever before. The Northern cotton mills have increased their consumption from 291,614 bales last year to 344,489 this year, an advance of 15 per cent,; but the greatest increase was in the South, where 45,000 bales were used this year to 35,000 during last year.

## MECHANICAL RECEIPTS AND ITEMS.

### To Break a Block of Iron.

A correspondent of the *American Machinist* writes: My method for breaking a block of iron would be to drill three rows of holes,even distances apart, three in each row, of 2° diameter, 18° deep; tap them 3° deep; then about the last of December, say Christmas Eve, fill the holes with water up to the bottom of the threads; screw down a good fitting plug hard down upon the water. Be sure about that part of it. All you will then have to do will be to sit up nights, and pray for cold, freezing weather—the colder the better.

### How to Straighten Wire.

A correspondent of the *Blacksmith and Wheelwright* says: To straighten wire take a piece of hard wood plank about a foot and a half long, draw a line lengthwise on the upper side. On the centre of this line bore three half inch holes; then a little to one side of the line bore two other holes. In each hole drive a hard wood pin, projecting a couple of inches. Now pass the wire from the right and left of these pins and draw it through with a pair of tongues or a hand vise. Oil the wire a little. The plank may stand with the pins horizontal, or vertical, as may be desired; held in the vise, nailed to the bench, or dovetailed to the wall. Instead of wooden pins, quarter-inch iron rod may be used, but if the wire be soft, like copper or annealed brass, the iron pins may scratch or mar its surface. The most perfect way to straighten wire when pulled through by hand power is to substitute small rolls for the pins. A groove must be turned in each roll to keep the wire in place. The labor of pulling it through is small compared with the labor of pulling it through the fixed pins. If two of these fixtures. be used, one being placed vertical and the other horizontal (if properly made), the wire will be as straight as human hands can make it. As these rolls need be made only an inch or an inch and a half in diameter, they must be made of iron or steel.—*Blacksmith and Wheelwright.*

### To Sharpen a Cold Chisel.

In sharpening a cold chisel it should be heated only to a cherry red and drawn down as thin as required, striking the last dozen blows on the flat side, care being taken at the same time to hold the chisel so as not to disturb the grain by bending. When ready, plunge into water not less than one inch and be sure to leave heat enough behind to draw the temper to the desired point, and this depends on the grade of steel you are working and what the chisel is intended to cut. If the steel were ever so well worked and only dipped into the water a quarter of an inch it would not stand, as there would be so little of the steel hardened. The remainder being soft would give way, allowing the hardened portion to break; whereas if the chisel had been plunged into the water an inch, the cutting edge would be backed up with what might be called a solid foundation and be able to stand severe blows. If any of the doubtful wish to satisfy themselves with respect to hammering on the flat side let them make two chisels from the same piece of steel. Sharpen both alike and when done take one of them and strike three or four blows on the edge, then harden the same as the other and give them a fair trial and be convinced.—*Blacksmith and Wheelwright.*

### Covering Wires

The following is an easy method for covering copper wire with gutta percha for electrical purposes: Some commercial gutta percha cut into small pieces is introduced in a bottle containing sulphide of carbon; this bottle must be kept well stopped. If agitated from time to time it dissolves at the ordinary temperature. When completely dissolved it is left to stand for some days, until the impure matters deposit at the bottom. It is then poured into another bottle, which is also kept well stopped, and at a low temperature; for thick wire the solution must be concentrated. The wire being dipped in this solution, the sulphide of carbon, evaporating, leaves on its surface a layer of gutta percha more or less thick. In order to operate continuously the solution is poured into a U tube, through which the wire is passed over a wooden pulley. The distance between the tube and the bobbin upon which the wire is rolled is about ten yards. In order that the sulphide of carbon may evaporate, this operation should be carried on in the open air.

## RAILROADS AND TRAFFIC.

WHAT is said to be the largest mortgage on file in the State of Ohio was filed with the County Recorder on the 24th ult. It was for the sum of $18,000,000 of bonds, and is filed by the Baltimore, Cincinnati & Western Railroad, a company organized under the laws of Maryland, Virginia and Ohio. The Mortgage is to the Mercantile Trust Company of New York, and is signed by E. A. Hoyt, President of the railroad Company.

WHAT Virginia needs more than anything else, says the *Industrial South*, (Richmond, Va.,) is railroads, because railroads are at the bottom of pretty much all modern prosperity. Railroads open mines, furnaces, factories, and set going all the wheels and levers of industry. They promote commerce and agriculture, enhance the value of lands, open new markets, advance the mechanic arts, diversify products, encourage enterprise, build cities, stimulate progress, and quicken all the pulses and paces of human energy and endeavor. They are needed that they may create taxable values. Their construction should be encouraged, not merely by exemption from all taxation if that were allowable, but by bounties and special privileges. See what they have done for other States. Look at the northwest, whose prodigious growth is the wonder of the world. Where but two or three decades ago there was nothing but a howling wilderness are now commonwealths that greatly exceed Virginia in population, prosperity and development; great and splendid cities, enormous production, and a rapidly coming control in the affairs of the national government. These are the fruits in very large measure of railroads.

THE extension of the Ohio division of the Indiana, Bloomington and Western, from Springfield, O., to Indianapolis, will be completed by the first of May, and by that time it is supposed trains will be running through from Sandnsky, O., to Peoria, Ill., without change. The road, when completed, will constitute one of the valuable roads to the State of Ohio, and will enter largely into the great system of roads that traverse the State from the north to the south and from the east to the west. It will be run in connection with the Lake Shore & Michigan Southern road from Sandusky east. Thus another great trunk line will penetrate the Southwest by connecting at Peoria with the Toledo, Peoria & Wabash, extending into Southwestern Missouri. From Sandusky to Peoria the line will be operated exclusively by the Indiana, Bloomington & Western, and from Northern Ohio will be a formidable competitor with the Ohio Railroad, which runs parallel as far west as Indianapolis.

THE lunch-boy service inaugurated by the Wabash system upon the trains which it was impossible to supply with dining cars is proving a great success, the traveling public taking to it very kindly.

ARTICLES have been filed for the incorporation of the Monday Creek Valley Railroad, to run from Bremen, Fairfield county, to a point where the line would again intersect the Ohio Central road at Chauncey, Athens county. Branches will also be constructed to Winona, Shawnee, Crafts, Buchtel and other points in the Monday Creek Valley. The incorporators are D. P. Eells, president, and Samuel Thomas, vice president of the Ohio Central, and C. S. Brice and others, who are interested in the same. The new line, if built, would make the Ohio Central a direct competitor with the Hocking Valley road for the coal and iron business of the Monday Creek Valley. The Hocking Valley people express doubts as to whether their rivals will go further than to incorporate the project. They say that their own Monday Creek branch commands all the best positions and mines in the region, and running up narrow ravines and through a rough country, as the Ohio Central people must, they would be at a great disadvantage and have very thin pickings.


### American Ladies.

The first impression Sara Bernhardt received of the American ladies manifested itself thusly: "Oh! ze ladies, za are so beautiful, such clear complexion I nevare see before," all of which is due to the universal use of Swayne's Ointment for skin diseases, which insures a clear and clean complexion and a healthy color. This recalls to mind the divine precept, "Cleanliness is next to Godliness."

## ITEMS OF INTEREST.

THE aggregate salaries of the postmasters of the United States reach $8,800,000.

THE first successful method of making vulcanized India rubber was patented in 1839.

THE Chamber of Commerce of Cincinnati has possession of their new quarters in Pike's Opera House.

A SINGLE vineyard near Dixon, Solano county, California, has just yielded 250,000 boxes of raisins, worth $500,000.

England receives annually from France 600,000,000 eggs; at twenty cent a dozen the value would be $10,000,000.

THE first steamships which made regular trips across the Atlantic Ocean were the Sirius and Great Western in 1830.

THE Department of Agriculture estimates the potato crop at 68 per cent of a full yield. In some districts it was almost a failure.

IT is estimated that the value of stoves being manufactured in the United States during 1881 will aggregate at least $75,000,000.

REAL estate in Holland has declined. Grazing land in Friesland, the garden of Holland, which brought in a rental of $400 or $500 per acre a few years ago, now rents for $10 or $15 per acre.

IT is a significant fact that the greatest age is frequently attained by those who have all their lives had rough and scanty fare, but have lived chiefly in the open air. Thus very aged people are frequent among the Irish peasantry.

A LARGE iron buoy has been towed from the Government works at Tompkinsville, Staten Island, N. Y., to the lower bay, where it is to be used to support an electric light. It is fitted with an apparatus intended to convert the power of wave-motion into electricity.

THE average yield per acre of wheat in 1881, as shown by the returns, is 10½ bushels against 13 1-10 in 1880, indicating a decrease of about 20 per cent or one hundred millions of bushels from last year's products, which reached nearly five hundred millions.

LARGE deposits of asbestos are said to have been discovered in South Carolina, the mineral being but a short distance below the surface. Immediately following the asbestos, apparently inexhaustible quantities of soap-stone have been found, which promises a copious supply for many years to come.

FROM the results of a large number of experiments it is found that the elasticity of toughened glass is more than double that of ordinary glass, and that toughened sheets bend much more readily than ordinary sheets. Single toughened glass has a resistance of 2.5 times, and demi-toughened glass a resistance of 3.1 times that of ordinary double glass.

THE Report on Railways of the Bureau of Statistics states that the laws of supply and demand and of free competition do not so operate as to regulate rates on railroads, this being attributable to the practical workings of corporate ownership, to the fact that the railroads of the United States constitute a highly organized and exceedingly complex system of transportation, to the fact that the relations of the various companies toward one another as transporters differ widely from the relations which are sustained toward one another by other corporate establishments.

THE most recent of the many great business ventures for which the year 1881 will long be memorable, is the plan of the Gaslight Transportation Company, of New York, to manufacture gas in immense quantities in the gas-coal region and deliver it to consumers in the principal cities of the country. It is understood that a large area of coal lands have been purchased during the present season, and it is the intention of the company to build large gas works near the mouths of the mines, which it is proposed to open without delay. From the works the manufactured product is to be taken in immense pipes to the cities along the Atlantic seaboard, and eventually to other large cities wherever a demand exists. The pipes that are to be first laid are from six to eight feet in diameter.

GENERAL P. A. WALKER, Superintendent of the Census, estimates the population in 1880 at about 65,000,000 and in 1890 at possibly 85,000,000.

THE nature of the manufactures in the Royal Gun Factory, England, necessitates the turning of very large and heavy masses. Lathes have therefore been designed and completed in this department remarkable for magnitude and power. They can deal with weights up to 200 tons, and are sufficiently powerful to reduce by 6 inches at a single cut the diameter of a 12 foot tube. These lathes have the following dimensions: 8 feet centers, 60 feet beds. There are nearly 200 tons of material employed on each of them, and the maximum power of their gearing is 160 to 1.

THE possibility of American wheat being eventually driven from the markets of Europe by grain from Tunis has been suggested. Land can be bought in Tunis, it is said, for half the price it can be bought in the Western States of the American Union, and it is so fertile that it yields two crops in the year. The quality of the grain, moreover, is equal to that of the much-prized Hungarian wheat. Excellent horses, though of a lighter breed, can be bought for a fraction of the cost of horses in the United States, and draft oxen for less than one-half the American price. All that is required to develop this competition is the extensive immigration of industrious European settlers, with European capital and agricultural appliances.

### Platinum Silvering.

Dissolve 10 oz. platinum in aqua regia, dry on water-bath, taking care, however, that the chloride of platinum does not decompose. The dry product obtained is rubbed on a plate with 40 oz. lavender oil, added little by little. Leave to clear for eight days in a porcelain dish, then pour off gently; allow the liquid to rest for six more days, then filter. The solution is now quite clear and has 1.035 specific gravity. Before using the solution, add 2½ oz. oxide of lead and 2½ oz. borate of lead, which have been ground with 1 oz. lavender oil. Mix well. The glass plate must be very clean, and the mixture be spread upon it several times. No dust should be allowed to deposit while drying. When the layer is quite dry the glass is heated and the oil evaporates, leaving a metallic film.

VIBRATIONS OF TELEGRAPH WIRES.—Some interesting facts are brought out in a paper by M. C. Nielsen, of Christiana, on the impression produced upon animals by the resonance of the vibration of telegraph wires. It is found that the black and green woodpeckers, for example, which hunt for insects in the bark and in the heart of decaying trees, often peck inside the circular hole made transversely through telegraph posts, generally near the top. The phenomenon is attributed to the resonance produced in the post by the vibration of the wire, which the bird mistakes as the result of the operation of worms and insects in the interior of the post. Everyone knows the fondness of bears for honey. It has been noticed that in mountainous districts they seem to mistake the vibratory sound of the telegraph wires for the grateful humming of bees, and, rushing to the post, look about for the hive. Not finding it on the post, they scatter the stones at its base which help to support it, and, disappointed in their search, give the post a parting pat with their paw, thus showing their determination at least to kill any bees that might be about it. Indisputable traces of bears about prostrate posts and scattered stones prove that this really happens. With regard to wolves, again, M. Nielsen states that when a vote was asked at the time for the first great telegraph lines, a member of the Storthing said that although his district had no direct interest in the line proposed, he would give his vote in its favor, because he knew the lines would drive the wolves from the districts through which they passed. It is well known that to keep off the ravages of hungry wolves in winter the farmers in Norway set up poles connected together by a line or rope, under which the wolves would not dare to pass. And it is a fact, M. Nielsen states, "that when, twenty or more years ago, telegraph lines were carried over the mountains and along the valleys, the wolves totally disappeared, and a specimen is now a rarity." Whether the two circumstances are casually connected, M. Nielsen does not venture to.

## MISCELLANEOUS RECEIPTS.

TO BRIGHTEN TARNISHED BRASS.—Prepare a bath composed of nitric acid mixed with an equal volume of water. The brass must not remain more than a few moments in the dip, and should be well rinsed in running water immediately after removal from the acid liquid.

TO BEND A WROUGHT IRON PIPE.—Fill it with melted resin. When the resin hardens, bend the pipe, and it will retain its round form. Remove the resin by melting.

TO WELD STEEL WITH LIME.—A correspondent of the *Mechanical Engineer* says: "If any of your readers have occasion to weld cast-steel let them try spent lime, air slacked—and use it just the same as borax; they will find it will answer quite as well and cost nothing."

TO CLEAN CUT STONE WORK.—To clean stone work (cut) in front of buildings use short, stiff wire scratch brushes, and dressing hammer if necessary, with plenty of water. If the stone is granite, trap-rock, or sandstone, diluted muriatic sulphuric acid may prove useful; but it is better to do without them if possible.

TO TEMPER LARGE CURVED DIES.—Fill the holes with fire-clay and wire to keep it in place. Heat evenly and slowly in a furnace. Lift the dies from the furnace with the face vertically into water heated to about 50° and containing about ¼ lb. salt per gallon. Hold them still at the bottom of the water until cooled.

TO REMOVE IRON-MOLD FROM LINEN.—Take some crystallized citric acid (acid of lemons), pound a a small quantity to a fine powder, and apply it to the spot; drop some hot water on it and rub it in on a pewter plate over a stove until the oxide of iron unites with the acid, when a little warm water washes all out.

PHOTO PROCESS ON WOOD ENGRAVING.—A simple plan is to coat the wood block with a little oxalate of silver, rubbed on with a drop or two of weak gum water. Lay your glass positive face downwards on the wood, and expose to the light. You will then have the design formed on the block in white on a dark ground. The engraver would have, of course, to cut away the dark parts instead of the light ones, as is usual. All these operations must be performed by a subdued light, or by gas or lamp light.

MARKING INK.—The following is a so-called indestructible ink: Dissolve 1 oz. gum arabic in 2 oz. water. Then add ¼ oz. indigo and ½ oz. lampblack, and triturate to a smooth fluid in a mortar. Then dissolve by boiling 1 oz. borax and 1 oz. shellac in 16 oz. water. Filter this last solution, and mix it with the former, stirring both well together.

TO FASTEN LEATHER OR RUBBER TO IRON.—Soak the leather in a warm solution of gall nuts and cover the iron, previously warmed, with a thin coat of glue. Place the leather in position on the iron and hold by pressure until dry. A varnish is also sometimes made for this purpose by dissolving, say, 4 ounces of gum arabic in water and a like quantity of isinglass in brandy. To fasten rubber to iron: Use a solution of shellac in ammonia, to prepare which, soak pulverized gum shellac in from 8 to 10 times its weight of strong ammonia and let it stand till it becomes clear, which will be some days. To apply, coat the two surfaces with the cement and hold them in contact, under pressure, till dry.

CARPENTERS should remember, says a building contemporary, that fresh glue dries much more rapidly than that which has been once or twice melted. Dry glue steeped in cold water absorbs different quantities of water according to the quality of the glue, while the proportion of water absorbed may be used as a test of the quality of the glue. From careful experiments with dry glue immersed for twenty-four hours in water at 60° Fahr., and thereby transformed into a jelly, it was found that the finest ordinary glue, or that made from white bones, absorbs twelve times its weight of water in twenty-four hours; from dark bones the glue absorbs nine times its weight of water; while the ordinary glue, made from animal refuse, absorbs but from three to five times its weight of water.

ALL the Milwaukee brick manufacturers are working their yards to the fullest capacity. It is said they realize a profit of from $3 to $4 a thousand.

## REVIEWS.

*The Longfellow Birthday Book.* Illustrated. Arranged by CHARLOTTE FISKE BATES. BOSTON: Houghton, Mifflin & Co. The Riverside Press, Cambridge, 1881. CLEVELAND: Cobb, Andrews & Co. ($1.)

For a handsome Christmas present of permanent value, let us commend this work. The accomplished compiler has selected the choicest productions of the great Harvard poet. Some bright prose extract with verses of Longfellow are set under each date of the year, two dates to a page, and opposite are two ruled off corresponding blanks, each surmounted by the birth on that day of some eminent character. The blank beneath is for the insertion of the birthdays of other individuals which the reader may wish to record, and at the end of the volume is a blank index arranged alphabetically in which the printed and added names may be entered for reference. The work thus provides for extertainment in research in the way of birthdays, and for a valuable repository of information. But supposing even that the blank pages are unused, here are the choicest thoughts, sentiments and fancies of our most famous living poet, which may be turned to at any hour or perused day by day, according to date, thus providing a livelong enjoyment, diverting the attention and storing the mind with brilliant images, philosophic thoughts, and those views of life in its many spheres which genius seizes and imprints for ever on the soul. The numerous engravings, prepared expressly for this work, are charming as well as illustrative. It is brought out with lavender cover, with impressed floral emblems. Within it presents one of the choicest specimens of typography that has come before us.

*Decimal Ready Reckoner and Metric Tables of Weights and Measures.* BY PHILETUS BURNHAM. LOWELL, MASS.: Stone, Huse & Co.

The author remarks in his preface: "The custom of keeping the time in our manufacturing establishments in hours instead of days, and the growing and very sensible practice of dropping vulgar fractions and substituting decimals, makes another reckoner for the computation of wages a necessity." His system of arrangement is not only original, but admits of ready reference in computations,and it will serve the purpose of every business man. The tests we have applied demonstrate its absolute correctness. Such a book has been wanted and will be welcomed. The Secretary of State should send a copy to all United States consuls abroad, so that they may be without excuse in continuing the present practice of setting down lengths, surfaces, weights, capacities and measures in foreign terms instead of English equivalents.

*Monsieur, Madame and the Baby.* By GUSTAVE DROZ. PHILADELPHIA: T. B. Peterson & Brothers.

This is a series of confessions in three parts, being "The Bachelor," "Madame and Housekeeping," and "The Baby in the Family." It is extremely vivacious; the wild joys of the bachelor are contrasted with the quietude and happiness of domestic life.

*The Art Amateur for December*, with extra Supplement. MONTAGUE MARKS, Editor and Publisher. NEW YORK: 23 Union Square.

This monthly journal devoted to the cultivation of art in the household takes the lead of all art magazines in this country or England. The frontispiece is a Japanese bronze vase. The Art Gallery contains exquisite engravings of choice works of American artists abroad. The section on Art in Dress will be perused with interest; it includes a satirical glance at selected illustrated specimens of street costumes, and there is given a Greek walking costume of 500 B. C., with its graceful folds. Art Decoration is continued with examples from the sixteenth century, which was fruitful of design. There are some fine examples of ceramics. Practical hints, illustrated, are furnished for room decoration. The Supplement contains no less than six full page illustrations of embroidery designs, etchings on linen, &c. The Extra Supplement contains classic and mediæval designs for panels.

*Cotton Facts.* A Book for Factors, Buyers, Spinners, and Planters. Fifth year of publication. NEW YORK: Alfred B. Shepperson, 25 Beaver street.

This work will be reviewed in our next issue.

*St. Nicholas for December.* NEW YORK: The Century Company.

Children's hearts are open at this season to the fullest amount of enjoyment, but no child or youth, who has read previous numbers of St. Nicholas, would think Christmas "the thing" without the December number. There is fun in it and a good deal more. Parents should consider the future influence of such a publication on the minds and character of their offspring, training them up gently, as it does, to acquire a taste for the beautiful in art, enlarging their affections by engaging characters, teaching them to discover new sources of amusement, filling their minds with attractive scenes in different spheres of life, and indulging them with all sorts of fanciful creations. No age but the present could have produced a St Nicholas. The Century Company some time since entered into negotiations with Santa Claus, but although his wife was crusty about mixing up the charming magazine with toys in their Lapland sleigh, the diplomatic efforts of Secretary Ellsworth proved successful, and on the outside page of this December number, Santa Claus is to be seen making tracks, eight reindeer in hand, over the Lapland snows for Ohio, with a vast bundle of St. Nicholas lying at top of his abundant wares, his path lighted up by the flames of a fierce aurora borealis.

*Golden Days.* NEW YORK. James Elverson, N. W. corner Ninth and Spruce streets.

This excellent weekly for youth is full of exciting and healthful stories. A feature of Southern life, corn-shocking, is vividly depicted in the last number. "Golden Days" provides plenty of amusement for winter evenings.

## MINES AND MINING.

THE announcement of a dividend by the Horn Silver Mining Company, of Frisco district, Utah, gives the assuring fact that the company have been steadily at work. The declaration of $300,000, a sum one third larger in amount than has been paid by the company in their two former dividends, is alike gratifying to the stockholders and the mining interest of the district. The effect must prove salutary and give to Utah that attention to which her mining industry is justly entitled.

THE Duluth (Minn.) Iron Company have decided to immediately begin the erection of a mammoth foundry adjacent to the blast furnace. The foundry will have a capacity of ten tons of castings per day. It is expected to be in operation within thirty days.

THE latest "rush" in Idaho is to the North Fork, about 15 miles above Ketchum, where a ledge 2½ feet wide of milling ore that assays up in the thousands was discovered about ten days ago. The discovery was purely accidental. A prospector slipped from a ledge of overhanging rocks into the water. In crawling on the bank he saw native silver and copper stains protruding from a crevice. A few minutes' work proved the existence of a ledge.

THE great point of interest in Montana at present is the discovery of wire gold recently on the 100-foot level of the Stevens mine, Butte County. It seems that such specimens, when found heretofore, were supposed to be the not uncommon tarnished silver, but were never tested for gold. The test of boiling nitric acid was applied; and the wire gold, in almost a pure state, was accurately demonstrated, mixed with some silver. In the main shaft, at the 200-foot level, the east drift is in 100 feet and the west drift about 110 feet. On the east level the ore varies from 15 to 30 inches, and assays about 80 ounces in silver and 20 ounces in gold. On the west, the ore continues about 12 or 15 inches wide, gradually increasing.

SOME splendid drillings have been made on the newly acquired territory of the Akron Coal Company. The characteristics of the new coal are a bright metalic lustre, an entire freedom from sulphur and a hardness almost equal to anthracite. Supt Reese calculates that the body of coal of this description underlies from 3,000 to 4,000 acres, a great portion of which territory has been leased by the company. It is shipping the bulk of its output to Cleveland, where it is eagerly sought for by steamboat men.—*Akron Beacon.*

THE Harrison coal cutter is at work in Rend's mines in the Sunday Creek district, Ohio.—*N. Y. Coal Trade Journal.*

THE mines of the Akron Iron Company at Buchtel are kept running as steadily as any in the Valley, but the miners do not get full work on account of the scarcity of railroal flats to carry the coal away, causing the loss of very much valuable time.

THE mines of lead (galena) of Wisconsin, Missouri and Southeastern Kansas, are more than equal to those of Spain and England, while the base silver ores of Utah, Colorado and Nevada furnish a supplement to our other lead product wholly unequalled by all other countries. The zinc mines of Wisconsin, Missouri and Kansas are far more extensive and richer than those of Belgium, Silesia and Sardinia. The copper mines of Lake Superior—exclusive of the extraordinary copper ores of Arizona—rival those of Chili. As for quicksilver the New Almaden mine of California exceeds the world-famous Almaden mine of Spain and that of Austrian Idria. Only Australia has ever produced as much placer gold as California has done—about $1,000,000,000. Now, by hydraulic processes applied to deep quartz mines, the United States are the largest producers of gold on the earth. All the mines of South America and Mexico in their palmiest days never furnished as much silver annually as was produced last year by our own mines. No other anthracite coal is comparable to that found in Pennsylvania. A field of bituminous coal extends from Northern Pennsylvania to the centre of Alabama, a distance of 800 miles, and embraces 60,000 square miles. We have iron ore of all descriptions in exhaustless quantities, and are only second to Great Britain in production. In mineral oil—petroleum—liquid coal as it may be called, the United States have a vast, apparently exhaustless reservoir not only in Pennsylvania and West Virginia, but on the Pacific Coast, affording the country an export trade for the fiscal year ending June 30th, 1880, of $36,218 625.

THE Hecla Consolidated Mining Company, Helena, Montana, will erect a concentrator next Spring of 100 tons capacity. There is an enormous quantity of second class ores at the various mines, estimated at 50,000 tons, which carries from seven to twenty per cent. of lead and from twenty to forty ounces of silver per ton, which with proper appliances can be easily concentrated into a most valuable product for furnace treatment. The company also contemplate building a flume ten miles long next spring,which will be used to transmit wood to the works, and sixteen more charcoal kilns will be added during the year. This company has paid more than $300,000 in dividends.—*Cor. of Mining World.*

### New Weighing Machine for Collieries.

Pit-bank weighing machines have been put down at several of the leading collieries in England constructed on a new principle. They are so arranged that the use of weights, springs, racks, pinions and wheels is entirely dispensed with, the principle of working being the creation of a vacuum in a column of water. This is effected by a simple arrangement. An ordinary steelyard is, at the poise end, connected with what may be described as a piston, contained in a column of water, inclosed within a small tin can, and this takes the place of the usual poise weights. The pressure brought upon the short arm of the lever as the colliery tubs are passed over the weighing table causes the piston to be lifted through the column of water, and the weight passing over the table is instantly recorded by a moving figure on a quadrant dial, in proportion to the quantity of water displaced. A taring arrangement is also provided for allowing for the weight of the tubs, so that the record given on the dial is the exact weight of the contents of the tubs.

### Man's Ingratitude

This is an ungrateful world to say the least. A man will act like a lunatic when he has the Itching Piles, and declare that he knows he can't live another day, yet he applies Swayne's Ointment, the intense itching is allayed at once, he gets cured, and goes down to the lodge without one whit of gratitude. When asked why he looks so cheerful, he dodges the question by an indifferent answer. Its just like a man though, isn't it?

## SCIENCE AND INVENTION.

ELECTRICAL INVENTIONS.—At the Paris Electric Exhibition is shown Edison's Weber meter, a delicate balance which registers the quantity of current which has traversed a circuit during a given time, and reveals and permits the measurement of a current so feeble that it will deposit only 1-2500 of an ounce of copper in 100 years. By means of a microtasimeter, heat has been discovered to reach us from the fixed stars. M. Gaston Tassandier exhibited a model balloon, which carries its own motive power, consisting of electric motors and the perfected secondary batteries or accumulators invented by M. Plante. The inventor calculates that with a dynamo machine weighing 660 pounds and with accumulators weighing 2,000 pounds, he could reach the speed of about sixteen miles an hour while carrying several passengers.

RESISTANCE OF STEEL TO FRACTURE.—The *Moniteur Industriel* states that the chief cause of variation in strength of steel is the presence of sulphur; that when free from this it will maintain the same breaking strain at all observed temperatures, the only change being a trifling variation of the limit of elasticity.

WATER POWER.—Water power is the least expensive power now known; and when it is taken from the deep basins or reservoirs through deep channels, as it must be from the Niagara river, it never freezes, never explodes, never wears out, never decays or rots, never shirks, never goes to sleep, is never spasmodic or unequal in its motion; costs nothing when it is idle, or not in use, requires no delay to bring it into action, but responds instantly and with full force the moment its action is required. Finally, it is a means of protection against fire, diminishing the risks of destruction and the rates of insurance, and is the strongest, safest, steadiest force we now control.—*American Miller.*

IMPROVEMENT IN COMPASSES.—Messrs. Miller and Pfaundler have introduced an improvement in compasses, by means of which the indications can be read with great accuracy. The magnetic needle carries near its ends two thin disks of aluminum; upon each of the disks a fine line is drawn so as to indicate the plane in which the pivot of the needle stands. A microscope and vernier are attached, together with a small disk of paper or mica, which stands perpendicularly upon the needle so as to bring it more speedily to rest by means of the resistance of the air.

A NEW THERMOGRAPH.—Dr. W. D. Bowkett has invented, says the Mechanical World, a new instrument for recording changes of temperature as measured by the action of heat upon a hollow circular metallic ring connected with a circular vessel, the whole being filled with a fluid and hermetically sealed. One end of the ring is fixed, the other free to move, and the amount of motion is magnified and measured by a series of levers, one end of which carries the recording pen. Increments of heat cause increments of pressure in the ring, which, as in Bourdoi's pressure gauge, then moves at its free end.

ACCUMULATION OF ELECTRICITY.—In order to accumulate electricity for the production of the electric light, M. J. Rousse has arranged secondary batteries which differ from those of M. G. Plante. At the negative pole he places a sheet of palladium, which during the electrolysis, absorbs more than 900 times its volume of hydrogen. At the positive pole he uses a sheet of lead. The electrolyzed liquid is sulphuric acid at 0.1. This element is said to be very powerful even when of small dimensions. Another secondary element which has also given good results is formed at the negative pole of a slender plate of sheet-iron. This plate absorbs more than 200 times its volume of hydrogen when electrolyzed in a solution of ammonium sulphate. The positive pole is formed of a plate of lead. Both these batteries were previously noticed briefly.

## MARKETS.

### FINANCIAL.

Office of the TRADE REVIEW.
FRIDAY EVENING, Dec. 2.

There is a fair demand for loans, though not for large amounts individually. The rates of discount are firmly maintained at 7 to 8 per cent Eastern exchange is in excessive supply and the market is heavy; depositors are accomodated at par. There is no change in the quotations for foreign exchange. The market for local securities is strong.

### IRON.

Prices for domestic pig iron are still more firm, and with some brands have advanced. The demand for foundry irons increases; the market is somewhat better supplied, but there is no weakening of prices. The following are our quotations for Scotch pig: Coltness, $26@$26; Langloan, $26 @$27; Gartsherrie, $26@$27; Glengarnock, $25.50; Eglinton, $23.50@$24. Scrap has been moving fairly during the week. Old rails maintain firmness. For manufactured iron it is impossible to secure contracts for future delivery at current rates. The market for bars is strong and with a heavy demand the supply is short. The requirements for tank iron cannot be fully met. Sheet iron is active and prices firmer. Structural iron orders cannot be placed for earlier than February delivery except at special rates.

CINCINNATI.—(Reported by Rogers, Brown & Co.)—The market has been more active the past week than the week before. Prices have stiffened slightly all around, but not sufficient to warrant a change in quotations. Buyers who looked for a lower market in December and January have modified their views and are disposed to take hold at prevailing figures. Forge irons continue lower in this than in surrounding markets, owing to the large stocks of metal held by the mills, and the recent shipments on the rise of water. Shipments on old orders continue large, and none of the furnaces are pressing for sales, the belief generally being that prices will go higher. We quote at 4 mos.: Hot Blast Foundry Iron—Hanging Rock charcoal No. 1 $28.50@30.00, 4 mo.; No. 2 $26.50@28.50, 4 mo.; Southern No 1, $26.50 @28, 4 mo ; Strong Coke, No. 1, $25.50@27, 4 mo. No. 2, 23.50@25.50, 4 mo.; No. 3, $22.50@24.00, 4 mo.; Soft Stonecoal No. 1, $23.00@25.50, 4 mo.; No. 2, $22.50@$23.50, 4 mo. Forge--Strong Neutral. No. 1 Mill $23.00@$24 00, 4 mo. Cold Short, No. 1, $20.50 @22.50, 4 mo. Car Wheel and Malleable--Hanging Rock Cold Blast, $37@41, 4 mo.; Hanging Rock Warm Blast, $29@31, 4 mo.; Southern Car Wheel $35@38, 4 mo.; Lake Superior, Car Wheel Iron, $33@35, 4 mo.; Lake Superior Malleable, $33@$35.

CINCINNATI.--(Reported by E. L. Harper & Co.)--The general features of the market continue the same as noted in our previous report. Stocks in the hands of sellers are light, prices strong and the demand fully up to the supply. The Rolling Mills here are all busy and report more than the usual quantity of orders coming in daily for this season of the year. The same can also be said for the iron foundries and machine shops.

### PIG TIN.

Prices have advanced again in the London market, and latest advices show £108 to be the lowest figure named. Banca, per pound, 28@29; Straits, per pound, 22¾@23; English, per pound, 24 Tin plates are also firm. We quote: Charcoal, I. C., $6.50@$7.50; Coke, I. C., $5.50@$6; Terne, I. C., $6@$8.

### SPELTER AND ZINC.

Consumers find a difficulty in procuring an adequate supply of zinc. Western brands command 5¾ to 6⅞ cents; Silesian is quoted at 5⅞ cents. Domestic and foreign sheet zinc are firm at 7⅛ to 7¼.

### INGOT COPPER.

An advance has taken place in Lake Ingots, and we quote 19½ to 19¼ cents asked for cash. Large purchases have been made at these figures; the present consumption is greater than at any previous time. We quote bolt copper at 18c.; heavy, 11⅛ to 12c.; light, 14⅛ to 17c.

### LEAD.

Somewhat moderate transactions have taken place in lead, with prices fully maintained. For Western, sellers ask 5 to 5⅛ cents, according to quantity, for common pig, and 5¼ for corroding. We quote lead solid 4½@4⅝; tea 4⅛@4¼.

### HARDWARE.

The jobbing trade continues active. The lively demand for skates has incited an advance in some descriptions. We have few price list or discount changes to record. Cut nails, for which there is a good demand, sell at $3.25 per keg. Foreign hardware is in good request, with unchanged prices. The orders given in for best grades of builders' hardware and carriage and agricultural implement supplies will not be filled for months. The American Vise and Tool Association has in view of the increase of cost of materials and labor, readjusted prices to a higher scale; it had previously withdrawn its quotations for specialties. The manufacturers of wrought iron square and barrel bolts have advanced their prices. The No. 12 Gravity Locking Blind Hinges manufactured by Sargeant & Co., have been advanced to 70 per cent. and 10 per cent cash. The agents for L. Coes & Co. have notified the trade that they are instructed to quote Coes' Genuine Screw Wrenches of either make at 40 and 10 per cent discount from list. Mechanics' Wrenches made by L. Coes & Co., and similar quality will continue to rate at 10 per cent. less than the "Genuine."

### LUMBER.

Trade is satisfactory, especially in the better grades the tendency of which is upward. Dealers are satisfied that present prices will be sustained. Contracts are being made at current prices for the coming season. Cleveland stocks are hardly commensurate with the prospective volume of trade; the continuous demand that has prevailed has broken up assortments. Selects and shingles have partaken of the increased activity. Hardwoods continue in good demand.

### WOOL.

Prices for domestic wools are firm. Dealers, says the Boston Journal of Commerce, feel quite confident in the value of choice wools and are satisfied to let the trade run along as at present. They think that as stocks become largely reduced there will be an advance secured in prices, especially as there is very little wool left in the interior. We quote XXX Ohio, 45@47; No. 1, 45@47; XX and above, 44@45; X, 41@42½.

### OILS.

Linseed, 65c. for raw, and 68c. for boiled; Lard, $1@$1.05 for extra W. S.; 82@85c. for No. 1; 65@ 68c. for No. 2. Quotations for petroleum are for car lots. For five barrels and under 2½c. added; ten barrels and under, 2c. added; twenty barrels and under, 16 for cash; if fifteen days time ½c. is added. We quote refined oil in car lots as follows: Standard White, 110 degrees, 7c.; Ohio Legal Test, 7¾c; Water White, O. S. T., 9¾c.; Michigan Legal Test, 9c.; Michigan Water White, 11½c; Wisconsin New Test, 7½c.; Headlights, 175 degrees, 10¾c. Most refiners are asking from 1½@2c. more than above quotations for prompt shipments.

## LUMBER.

### PLANK.

5-4 or 1¼ Inch.

| | |
|---|---|
| A 1 and 2 uppers | $46 |
| A 3 | 38 |
| B select | 32 |
| Common | 16@20 |
| Culls | 13 |

6-4 or 1½ Inch.

| | |
|---|---|
| A 1 and 2 uppers | 46 |
| A 3 box | 38 |
| B select | 32 |
| Common | 16@20 |
| Culls | 13 |

8-4 or two Inch.

| | |
|---|---|
| A 1 and 2 uppers | 46 |
| A 3 box | 38 |
| B select | 32 |
| Common | 16@20 |
| Culls | 13 |

2½, 3 and 4 inch special.

### INCH LUMBER.

| | |
|---|---|
| A 1 and 2 uppers | $42 |
| A 3 box | 34 |
| B select | 30 |
| B select wide, 16 inches and over | 32 |
| C Common | 20 |
| D " | 15 |
| Wide " 16 inch and over | 18 |
| Culls | 13 |
| B Stocks, 12 inch | 31 |
| C " 12 inch | 21 |
| C " 10 inch | 20 |
| C " 12 inch, 18 and 20 feet | 23 |
| C " 10 inch " " | 22 |
| D Stocks | 16 |
| A 1 and 2 Strips, 6 inch | 42 |
| A 3 Strips for Fig and Sdg | 35 |
| C Strips | 21 |
| D Strips or fencing, 16 feet | 15 |
| D Strips or fencing, 12 and 14 feet | 14 |
| Norway Fencing, 16 feet | 17 |
| B Norway Bds and Stps | 22 |

### MILL WORK.

| | |
|---|---|
| Surfacing one side adds to the price of rough lumber $1.50, two sides | $2 00 |
| Matching | 2 50 |

### SHINGLES, LATH, CEDAR POSTS, ETC

| | |
|---|---|
| Shingles XXX | $4 00 |
| Shingles Clear Butts | 3 00 |
| Lath | 3 00 |
| Cedar Posts, large | 30 00 |
| " " medium | 25 00 |
| " " small | $15 to 20 00 |

### BILL STUFF.

| | |
|---|---|
| Joist and Scantling, 18 feet and under | 15 |
| Small timber | 16 |
| Joist, Scantling and Timber, 20 feet | 17 |
| Joist, Scantling and Timber, over 20 feet $3, off length. | |
| Heavy Timber, over 8x8 } Special. | |
| Heavy Joist, over 2x12 } | |

### WORKED LUMBER

| | |
|---|---|
| Flooring, matched A 3 | $40 |
| Flooring, matched, B select | 33 |
| Flooring, matched, C common | 22 |
| Drop or coved sdg same as fig. siding, ⅛ inch bevel, clears | 24 |
| Siding, ⅛ inch bevel, common | 20 |

### HARDWOODS.

| | |
|---|---|
| OAK.—1st and 2d clear, 1 to 4 inch | $35 00 |
| 3d | 30 00 |
| 1st common | 25 00 |
| 2d common | 28 00 |
| BLACK WALNUT—Clear counter tops, 20-inch and up | 150 00 |
| 1st and 2d inch | 75 00 |
| 1st and 2d plank | 80 00 |
| Common | 55 00 |
| Select, ⅝x10 inch and over | 68 00 |
| ASH--1 to 2 inch, $35, over 2 inch | 38 00 |
| Wagon stock | 40 00 |
| HICKORY wagon stock 1 to 4 inch | 50 00 |
| MAPLE--Clear, 1 to 4 inch | 35 00 |
| BUTTERNUT--1st and 2d clear, 1-inch | 55 00 |
| CHERRY--1st and 2d clear, 1-inch | 60 00 |
| WHITEWOOD--Clear selected, w'd 1 to 4 in. | 40 00 |
| 1st and 2d clear, 1 to 4 inch | 35 00 |
| Selected | 30 00 |

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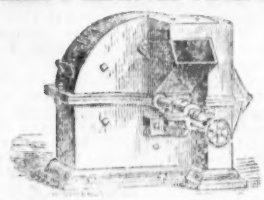

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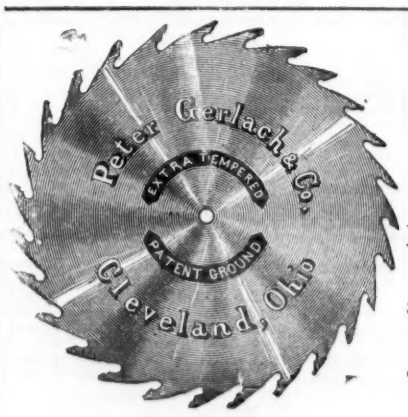


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